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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,773	07/31/2003	Takayuki Yogo	056208.52613US	8467
23911	7590	03/28/2006	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			WILLIAMS, ALEXANDER O	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,773

Applicant(s)

YOGO ET AL.

Examiner

Alexander O. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18 to 22, 24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18 to 22, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/28/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Serial Number: 10/630773 Attorney's Docket #: 740819-982

Filing Date: 7/31/2003; claimed foreign priority to 8/1/2002

Applicant: Yogo et al.

Examiner: Alexander Williams

Applicant's Amendment filed 12/28/05 to the election of species of figure 6 (formerly claims 1, 2 and 6-17), filed 9/9/04, has been acknowledged.

Claims 1-17 and 23 have been canceled.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electronic device containing in a case member which is disposed in an air cleaner or an air duct of an automobile, comprising: a substrate having electronic elements mounted thereon, and conductor wire films made of silver or silver alloys, the conductor wire films being connected to the elements; an insulating overcoat film made of a material selected from the group consisting of glass and resin covering the surface of the device, including the conductor wire films; wherein, the overcoat has openings through which surfaces of the conductor wires films are exposed; the openings are formed in a shape having no square corners and no acute angle corners; the entire exposed surfaces of the conductor wire films are covered with a solder wire films are protected from any corrosive gas that may enter the case member; and said electronic elements and said insulating over comprise thick film elements formed on said substrate in claim 18; electronic device disposed in a case member placed in an air duct, comprising: a substrate having conductor wire films made of silver or silver alloys and electronic elements mounted thereon, said electronic elements including at least one element selected from the group consisting of **resistors**, capacitors, inductors, and diodes, the conductor wire films being connected to the at least one element; and an insulating overcoat film made of a material selected from the group consisting of glass and resin covering the surface of the device, including the conductor wire films; wherein the overcoat has openings through which surfaces of the conductor wire film are exposed;

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the openings are formed in a shape having no square corners and no acute angle corners; the entire exposed surfaces of the conductor wire films are covered with a solder whose main component is tin, whereby the exposed surface of the conductor wire films are protected from any corrosive gas that may enter the case member; and said electronic elements and said insulating overcoat comprise thick film elements formed on said substrate in claim 19; the electronic device for a case member disposed in an air duct of an automobile, comprising: a substrate having a conductor wire films made of silver or a silver alloy mounted thereon; and an insulating overcoat film made of an insulating material covering the conductor wire film; wherein the overcoat has an opening having no acute angle corner wherein a surface of the conductor wire films is exposed through an opening formed in the overcoat; and the surface of the exposed conductor wire films is covered with a solder whose main component is tin in claim 24; and an electronic device for a case member disposed in an air duct of an automobile, comprising: a substrate having a resistor film mounted thereon, the resistor having conductor wire films and terminals connected thereto; and an overcoat film made of an insulator covering the resistor the conductor wire films and the terminals; wherein, the overcoat film has an opening formed in a shape having no acute angle corners wherein a surface of the conductor wire films is exposed; and the exposed surface of the conductor wire (films) is covered with a solder whose main component is tin in claim 25 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

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changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claims 18 to 22, 24 and 25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 18, 19, 24 and 25, it is unclear and confusing to what structure is claimed in each claim. The species to be examined is figure 6. How and where does this elected structure relate to the claimed structures and where is this combination shown in the drawing? Where are the combination of each item in each structure claimed shown in the drawings?

In claim 25, line 9 the phrase "the conductor films" should be --conductor wire film--. Applicant claims "the conductive films is".

In claims 24 and 25, are there more than one conductive wire films? If so, should theses read --the conductive wire films are--?

Any of claims 18 to 22, 24 and 25 not specifically addressed above are rejected as being dependent on one or more of the claims which have been specifically objected to above.

For example, the elected species was figure 6 in which a resistor, not a conductor, is claimed. Where is this structure shown in the drawings?

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18 to 22, 24 and 25, insofar as they can be understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Aisenbrey (U.S. Patent Application Publication # 2005/0269727 A1).

18. Aisenbrey (figures 1 to 13) specifically figures 1 and 7 show an electronic device containing in a case member **104** which is disposed in an air cleaner or an air duct **110** of an automobile, comprising: a substrate **14** having electronic elements mounted thereon, and conductor wire films (**silver fiber**) made of silver or silver alloys, the conductor wire films being connected to the elements; an insulating overcoat film made of a material selected from the group consisting of glass and **resin** covering the surface of the device, including the conductor wire films; wherein, the overcoat has openings through which surfaces of the conductor wire films are exposed; the openings are formed in a shape having no square corners and no acute angle corners; the entire exposed surfaces of the conductor wire films are covered with a solder wire films are protected from any corrosive gas that may enter the case member; and said electronic elements and said insulating overcoat comprise films formed according to thick film technology.

19. Aisenbrey (figures 1 to 13) specifically figures 1 and 7 show an electronic device disposed in a case member **104** placed in an air duct **110**, comprising: a substrate **14** having conductor wire films (**silver fiber**) made of silver or silver alloys and electronic elements mounted thereon, said electronic elements including at least one element selected from the group consisting of resistors, capacitors, inductors, and diodes, the conductor wire films being connected to the at least one element; and an insulating overcoat film made of a material selected from the group consisting of glass and **resin** covering the surface of the device, including the conductor wire films; wherein the overcoat has openings through which surfaces of the conductor wire film are exposed; the openings are formed in a shape having no square corners and no acute angle corners; the entire exposed surfaces of the conductor wire films are covered with a solder whose main component is tin, whereby the exposed surface of the conductor wire films are protected from any corrosive gas that may enter the case member; and

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said electronic elements and said insulating overcoat comprises film formed according to thick film technology.

20. The electronic device according to Claim 18, Aisenbrey show wherein the openings have a shape that is selected from the group consisting of a round, elliptical, **rectangular** with round corners, and rectangular with chamfered corners (see figure 6a and b).

21. The electronic device according to Claim 18, Aisenbrey show wherein the openings are covered with a conductive metal paste (cermet paste).

24. Aisenbrey (figures 1 to 13) specifically figures 1 and 7 show an electronic device for a case member disposed in an air duct of an automobile, comprising: a substrate **14** having a conductor wire films (**silver fiber**) made of silver or a silver alloy mounted thereon; and an insulating overcoat film made of an insulating material covering the conductor wire film; wherein the overcoat has an opening having no acute angle corner wherein a surface of the conductor wire films is exposed though an opening formed in the overcoat; and the surface of the exposed conductor wire film is covered with a solder whose main component is tin.

25. Aisenbrey (figures 1 to 13) specifically figures 1 and 7 show an electronic device for a case member disposed in an air duct **110** of an automobile, comprising: a substrate **14** having a resistor film mounted thereon, the resistor having conductor wire films (**silver fiber**) and terminals connected thereto; and an overcoat film made of an insulator covering the resistor the conductor wire films and the terminals; wherein, the overcoat film has an opening formed in a shape having no acute angle corners wherein a surface of the conductor wire films is exposed; and the exposed surface of the conductor wire films is covered with a solder whose main component is tin.

ABSTRACT:

Vehicle air intake and exhaust handling devices are formed of a conductive loaded resin-based material. The conductive loaded resin-based material comprises micron conductive powder(s), conductive fiber(s), or a combination of conductive powder and conductive fibers in a base resin host. The percentage by

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weight of the conductive powder(s), conductive fiber(s), or a combination thereof is between about 20% and 50% of the weight of the conductive loaded resin-based material. The micron conductive powders are metals or conductive non-metals or metal plated non-metals. The micron conductive fibers may be metal fiber or metal plated fiber. Further, the metal plated fiber may be formed by plating metal onto a metal fiber or by plating metal onto a non-metal fiber. Any platable fiber may be used as the core for a non-metal fiber. Superconductor metals may also be used as micron conductive fibers and/or as metal plating onto fibers in the present invention.

[0035] This invention relates to vehicle air intake and exhaust handling devices molded of conductive loaded resin-based materials comprising micron conductive powders, micron conductive fibers, or a combination thereof, substantially homogenized within a base resin when molded.

[0036] The conductive loaded resin-based materials of the invention are base resins loaded with conductive materials, which then makes any base resin a conductor rather than an insulator. The resins provide the structural integrity to the molded part. The micron conductive fibers, micron conductive powders, or a combination thereof, are substantially homogenized within the resin during the molding process, providing the electrical, thermal, and/or acoustical continuity.

[0039] Resistivity is a material property that depends on the atomic bonding and on the microstructure of the material. The atomic microstructure material properties within the conductive loaded resin-based material are altered when molded into a structure. A substantially homogenized conductive microstructure of delocalized valance electrons is created. This microstructure provides sufficient charge carriers within the molded matrix structure. As a result, a low density, low resistivity, lightweight, durable, resin based polymer microstructure material is achieved. This material exhibits conductivity comparable to that of highly conductive metals such as silver, copper or aluminum, while maintaining the superior structural characteristics found in many plastics and rubbers or other structural resin based materials.

[0042] The micron conductive fibers may be metal fiber or metal plated fiber. Further, the metal plated fiber may be formed by plating metal onto a metal fiber or by plating metal onto a non-

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metal fiber. Exemplary metal fibers include, but are not limited to, stainless steel fiber, copper fiber, nickel fiber, silver fiber, aluminum fiber, or the like, or combinations thereof. Exemplary metal plating materials include, but are not limited to, copper, nickel, cobalt, silver, gold, palladium, platinum, ruthenium, and rhodium, and alloys of thereof. Any platable fiber may be used as the core for a non-metal fiber. Exemplary non-metal fibers include, but are not limited to, carbon, graphite, polyester, basalt, man-made and naturally-occurring materials, and the like. In addition, superconductor metals, such as titanium, nickel, niobium, and zirconium, and alloys of titanium, nickel, niobium, and zirconium may also be used as micron conductive fibers and/or as metal plating onto fibers in the present invention.

[0053] Another method to provide connectivity to the conductive loaded resin-based material is through the application of a **solderable ink film** to the surface. One exemplary solderable ink is a combination of copper and solder particles in an epoxy resin binder. The resulting mixture is an active, screen-printable and dispensable material. During curing, the solder reflows to coat and to connect the copper particles and to thereby form a cured surface that is directly solderable without the need for additional plating or other processing steps. Any solderable material may then be mechanically and/or electrically attached, via soldering, to the conductive loaded resin-based material at the location of the applied solderable ink. Many other types of solderable inks can be used to provide this solderable surface onto the conductive loaded resin-based material of the present invention. Another exemplary embodiment of a solderable ink is a mixture of one or more metal powder systems with a reactive organic medium. This type of ink material is converted to solderable pure metal during a low temperature cure without any organic binders or alloying elements.

[0060] Referring now to FIG. 7, a second preferred embodiment of the present invention is illustrated. An air intake duct system 110 comprising conductive loaded resin-based material is shown. The embodiment represents only one example of the many shapes, forms, and types of vehicle air ducting that may be formed of conductive loaded resin-based material. The word ducting is used herein to describe plenums, tubes, pipes, ducts, hoses and/or other devices which may be used to transport or otherwise direct the flow of intake and/or exhaust air. Conductive loaded

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resin-based material provides many advantages over conventional metal and/or plastic materials commonly used for ducting applications. Conductive loaded resin-based material ducts are easily extruded and formed in any shape and size that is desired for the particular vehicle application. This results in low cost, reduced weight, dimensionally accurate ducting that is well-suited for vehicle air intake and exhaust applications. Air resistance against the duct sidewalls is also reduced by the use of conductive loaded resin-based material. Further benefits include noise reduction and EMI/RFI absorption.

Initially, it is noted that the 35 U.S.C. § 103 rejection based on a substrate have at least two layers deals with an issue (i.e., the integration of multiple pieces into one piece or conversely, using multiple pieces in replacing a single piece) that has been previously decided by the courts.

In Howard v. Detroit Stove Works 150 U.S. 164 (1893), the Court held, "it involves no invention to cast in one piece an article which has formerly been cast in two pieces and put together...."

In In re Larson 144 USPQ 347 (CCPA 1965), the term "integral" did not define over a multi-piece structure secured as a single unit. More importantly, the court went further and stated, "we are inclined to agree with the solicitor that the use of a one-piece construction instead of the [multi-piece] structure disclosed in Tuttle et al. would be merely a matter of obvious engineering choice" (bracketed material added). The court cited In re Fridolph for support.

In re Fridolph 135 USPQ 319 (CCPA 1962) deals with submitted affidavits relating to this issue. The underlying issue in In re Fridolph was related to the end result of making a multi-piece structure into a one-piece structure. Generally, favorable patentable weight was accorded if the one-piece structure yielded results not expected from the modification of the two-piece structure into a single piece structure.

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Claim 22, **insofar as claim 22 can be understood**, is rejected under 35 U.S.C. § 103(a) as being unpatentable over Aisenbrey (U.S. Patent Application Publication # 2005/0269727 A1).

22. The electronic device according to Claim 18, Aisenbrey show wherein the substrate has at least two layers.

Therefore, it would have been obvious to one of ordinary skill in the art to use the substrate having at least two layers as "merely a matter of obvious engineering choice" as set forth in the above case law.

Response

Applicant's arguments filed 12/28/05 have been fully considered, but are moot in view of the new grounds of rejections detailed above.

The listed references are cited as of interest to this application, but not applied at this time.

Field of Search	Date
U.S. Class and subclass: 257/48,620,686,685,723,777,528,532	11/18/04 6/4/05 9/19/05 3/17/06
Other Documentation: foreign patents and literature in 257/48,620,686,685,723,777,528,532	11/18/04 6/4/05 9/19/05 3/17/06
Electronic data base(s): U.S. Patents EAST	11/18/04 6/4/05 9/19/05 3/17/06

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30AM -7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272 1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexander O Williams
Primary Examiner
Art Unit 2826

AOW
3/17/06